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**ORGANISATION DES NATIONS UNIES
POUR L'EDUCATION, LA SCIENCE ET LA CULTURE**

CONVENTION CONCERNING THE PROTECTION OF THE WORLD CULTURAL AND NATURAL HERITAGE

CONVENTION CONCERNANT LA PROTECTION DU PATRIMOINE MONDIAL, CULTUREL ET NATUREL

WORLD HERITAGE COMMITTEE / COMITE DU PATRIMOINE MONDIAL

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Item 7 of the Provisional Agenda: State of conservation of properties inscribed on the World Heritage List and/or on the List of World Heritage in Danger

Point 7 de l'Ordre du jour provisoire: Etat de conservation de biens inscrits sur la Liste du patrimoine mondial et/ou sur la Liste du patrimoine mondial en péril

MISSION REPORT / RAPPORT DE MISSION

Selous Game Reserve (United Republic of Tanzania) (N 199bis)
Réserve de gibier de Selous (République-Unie de Tanzanie) (N 199bis)

8 – 15 February 2017

IUCN

Reactive Monitoring Mission

Selous Game Reserve World Heritage site, United Republic of Tanzania

8 - 15 FEBRUARY 2017

Photo ©IUCN/Roger Porter

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Cover Photo: Rufiji River in the Selous Game Reserve

Acronyms and Abbreviations

DAWASA	Dar es Salaam Water and Sewerage Authority
DSOCR	Desired state of conservation for the removal of the property from the List of World Heritage in Danger
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
FZS	Frankfurt Zoological Society
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German development agency)
GMP	General Management Plan
IAEA	International Atomic Energy Agency
ISL	In-Situ Leaching
IUCN	International Union for Conservation of Nature
IWRMD	Integrated Water Resources Management and Development
KfW	Kreditanstalt für Wiederaufbau (German Development Bank)
MEM	Ministry of Energy and Minerals
METT	Management Effectiveness Tracking Tool
MNRT	Ministry of Natural Resources and Tourism
MoU	Memorandum of Understanding
MRP	Mkuju River Project
MW	Megawatt
NEMC	National Environmental Management Council
NGR	Niassa Game Reserve
OUV	Outstanding Universal Value
PROTECT	Promoting Tanzania's Environment, Conservation, and Tourism (project funded by USAID)
RUBADA	Rufiji Basin Development Authority
SAGCOT	Southern Agricultural Growth Corridor of Tanzania
SEA	Strategic Environmental Assessment
SECAD	Selous Ecosystem Conservation and Development Project
SESA	Strategic Environmental and Social Assessment
SGR	Selous Game Reserve
SOC	State of conservation report (compiled by the World Heritage Centre and IUCN)
SOUV	Statement of Outstanding Universal Value
TAEA	Tanzania Atomic Energy Agency
TANAPA	Tanzania National Parks Authority
TAWA	Tanzania Wildlife Authority
TAWIRI	Tanzania Wildlife Research Institute
UNESCO	United Nations Educational, Scientific and Cultural Organisation
USAID	United States Agency for International Development
VGS	Village Game Scout
WCA	Wildlife Conservation Act
WCU	Wildlife Crime Unit
WMA	Wildlife Management Area
WRM	Water Resources Management
WWF	World Wide Fund for Nature

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The mission sincerely thanks the Ministry of Natural Resources and Tourism, and the Tanzania Wildlife Authority (TAWA) for coordinating and facilitating the meetings and field visits. Appreciation goes also to the Tanzanian National Parks Authority (TANAPA), UNESCO National Commission and all of the Selous Game Reserve staff for their contributions and for accompanying the mission throughout the visit.

The mission wishes to express its appreciation to all of the following governmental agencies and ministries that met with the mission and openly shared invaluable information: Dar es Salaam Water and Sewage Authority (DAWASA), the Ministry of Energy and Minerals, Ministry of Water and Irrigation, the National Environmental Management Council (NEMC), the Rufiji Basin Development Authority (RUBADA), Tanzania Atomic Energy Agency (TAEA), Tanzania Hunting Operator Association (TAHOA), Tanzania Association of Tour Operator (TATO), Tanzania Wildlife Research Institute (TAWIRI), Tourism Confederation of Tanzania (TCT), the Wildlife Crime Unit and the Wildlife Division. Thanks are also due to Mantra Tanzania Ltd and the representatives of Mbarang'andu Wildlife Management Area, District Commissioner and District Executive Director.

The mission also wishes to thank the Frankfurt Zoological Society (FZS), World Wide Fund for Nature (WWF-Tanzania), the German Development Agency (GIZ) and the German Development Bank (KfW) for sharing their insightful knowledge on their activities in the Selous ecosystem.

Executive Summary and List of Recommendations

The Reactive Monitoring mission was undertaken from 8 to 15 February 2017 following World Heritage Committee Decision **40 COM 7A.47** (Istanbul, 2016). The objective of the mission was to evaluate progress in combating poaching, and to assess the current status and likely impacts of the proposed In Situ Leaching at the Mkuju River Project (MRP), the Stiegler's Gorge Hydropower and Kidunda Dam projects, and prospecting licences overlapping with and adjacent to the property, as well as any other development that might impact the Outstanding Universal Value (OUV) of the property.

The mission met with a range of stakeholders, predominately government authorities, and visited the proposed MRP uranium mining site, Selous Game Reserve (SGR) headquarters in Matambwe, Tanzania Wildlife Authority's (TAWA) headquarter in Morogoro, a Wildlife Management Area (WMA), and an aerial view over the proposed sites of Kidunda Dam and Stiegler's Gorge Hydropower projects.

Since inscription of the property on the List of World Heritage in Danger in 2014 for its ensuing dramatic decline in elephant population, considerable progress has been made by the State Party, specifically the newly inaugurated TAWA, to address the poaching crisis in the property, and through international collaborations, further projects are in the pipeline to strengthen its efforts. These include activities within the property as well as in the Selous-Niassa corridor through inter-governmental efforts with Mozambique, and in WMAs surrounding the property. The State Party has made commendable progress to date. Although acknowledging such achievements, the mission also notes that further progress is required until the property is at a point of recovery that it could be removed from the List of World Heritage in Danger.

Additional studies are needed to reliably monitor the recovery of wildlife including elephants, which should serve as one of the key indicators towards removal of the property from the Danger List. The mission notes with caution, the use the aerial elephant census data to determine population changes due to its limitations and inaccuracies, and considers a demographic study to be critical. Further studies are also needed to determine the size of the remaining rhino population, including its viability, and a population census of ungulates as identified under criterion (x) of the Statement of OUV. The mission was informed that TAWA will submit the revised Desired state of conservation for the removal of the property from the List of World Heritage in Danger (DSOCR) and Emergency Action Plan for the property by December 2017. The urgent revision of the 2005-2015 General Management Plan in this context, is critical for the protection of the property.

Several development projects are proposed inside or in the vicinity of the property and concern the protection of the property's OUV. The Kidunda Dam project is currently the most advanced of the various projects in its planning, with its Environmental and Social Impact Assessment (ESIA) almost completed for stakeholder review. The project is relatively small but may lead to the inundation of some of the property, thereby affecting wildlife movement and loss of wildlife habitat. The State Party should therefore firstly consider a project design that will not inundate any part of the property at full supply level, but in case this is not possible the ESIA requires further analyses. Testing for uranium mining at MRP is proceeding, but the ISL method, to be used alongside the previously proposed open-cast method, needs extensive analyses in the form of an ESIA. The exact project description is however still unknown as the project operator, Mantra, is exploring other alternative extraction methodologies, and it is understood that a clearer timeline on decision making was to become available in March 2017. The foreseeable impact of Stiegler's Gorge Hydropower project is irreversibly damaging to the OUV of the property and clearly not in line with the Committee's position on the incompatibility of dams with large reservoirs inside a World Heritage

property. Although it may still be at a conceptual stage, the inclusion of the project in the updated 2016 National Power System Master Plan for Tanzania, and the renewal of the Memorandum of Understanding (MoU) between the Rufiji Basin Development Authority (RUBADA) and Odebrecht, is of utmost concern. The proposed oil and gas exploration at Kito-1 in the Kilombero Valley Floodplain Ramsar site, requires a detailed specialist study on the hydrological regime of the floodplain. This specialist study should subsequently inform the EIA for the oil and gas exploration, which includes a specific assessment of potential downstream impacts on the OUV of the property, especially considering that the Kilombero Valley Floodplain with its rivers supplies two thirds of the Rufiji River waters. Permission to proceed with the drilling should not be given before the specialist study and the EIA has been reviewed by IUCN.

In addition, intrusion by cattle posed by increasing and intensifying livestock grazing appears to be a serious emerging threat, which requires careful monitoring and management. Although invasive alien species (IAS) were not observed or noted in this mission, highly invasive species have previously been recorded, and hence a continuous monitoring mechanism needs to be applied to prevent the spread of such species. On-going efforts to ensure compliance of trophy hunting (within the consumptive-use zones of the property and WMAs) with a carefully monitored quota is needed, but in light of decreasing revenue generation in the trophy hunting sector may require the State Party to explore additional models to secure a financially sustainable solution.

In summary, the mission makes the following recommendations to the State Party:

Recommendation 1: Evaluate the 2005-15 General Management Plan for Selous Game Reserve (SGR) and produce a revised Plan for the next five years as a matter of priority. This Plan should be aligned with TAWA's Strategic Plan, which is currently undergoing development. Copies of both Plans should be submitted to the World Heritage Centre once they have been completed.

Recommendation 2: Rigorously and regularly apply the Management Effectiveness Tracking Tool (METT) in particular to assess effectiveness of anti-poaching activities as ground and aerial patrol monitoring technologies are applied and implemented.

Recommendation 3: Plan for continuity of the existing and planned conservation projects in the property and the wider Selous ecosystem with donors and implementers to prevent post-project collapse or decline at the end of the projects.

Recommendation 4: Conduct a scientific study of the elephant population demography in SGR to determine its age and sex structure including ageing of calves of <1 to approximately 6 years old, in order to determine the population growth. This will be a critically important indicator in support of any future proposal for the removal of the property from the List of World Heritage in Danger.

Recommendation 5: Undertake a research project to determine the size of the black rhinoceros population, its age and sex structure within the property. Building on the findings, it may be necessary to undertake a genetic study to determine the viability of the population, and thereby inform subsequent decision-making of the introduction of new genetic stock of this sub-species from sources elsewhere, provided that poaching is brought sufficiently under control to ensure the security of any released rhino.

Recommendation 6: Determine and undertake population monitoring of selected herbivore species populations to determine trends, in relation to the species (and subspecies) specified in the Statement of Outstanding Universal Value (OUV) of the property.

Recommendation 7: Produce a Management Plan for each of the 10 Wildlife Management Areas (WMAs) in the wider Selous ecosystem in line with the 2012 Wildlife Conservation (WMAs)

Regulation. Such a Plan should include explicit interventions and activities that would strengthen the conservation management of each of these areas.

Recommendation 8: Consider a project design for Kidunda Dam that will not inundate any part of the property at full supply level. Should this not be possible, then noting the greater concern for the project and to determine its acceptability in line with the World Heritage status, develop and incorporate into the ESIA for submission to the World Heritage Centre for review by IUCN, a model of the frequency, extent and duration of the flooding regime inside the property, resulting from the proposed Kidunda Dam, and determine survival tolerance levels of woody vegetation species to duration of inundation.

Recommendation 9: Permanently abandon the Stiegler's Gorge Hydropower project due to its obvious foreseeable adverse impact on the Outstanding Universal Value (OUV) of the property, and in line with the Committee's position that dams with large reservoirs located within World Heritage properties are incompatible with their World Heritage status, and pursue alternative options located outside of the property boundaries that will not impact on its OUV.

Recommendation 10: Should In Situ Leaching (ISL) be considered as a possible methodology for uranium ore extraction at Mkuju River Project (MRP) by Mantra, it should be ensured that the ESIA comprehensively addresses the following:

a) the potential impacts and mitigation measures of using the ISL approach, which includes a thorough assessment of the radioactive decay products of uranium;
b) an early warning system in the case of an accident or seepage and an emergency response to such events;
c) a long term plan for decommissioning and environmental monitoring following the mine closure;
d) all direct and indirect impacts of the uranium mining project on both on-site and adjacent areas that may lie beyond the mining lease area, as well as matters of compliance with international atomic energy standards for uranium mining.

A copy of the ESIA should be submitted to the World Heritage Centre for review by IUCN as soon as it is available, and before any decisions are taken.

Recommendation 11: Noting that there are several uncertainties and that multiple methodologies may be adopted for the Mkuju River Project, ensure that an ESIA is undertaken for each proposed extraction method, and that in addition, the operator undertakes a study to assess the cumulative impacts of all activities, methods of uranium extraction, intervention, and construction of facilities at the site.

Recommendation 12: Provide an update on the additional valuable wildlife forest area to implement the Committee Decision **36 COM 8B.43** to propose an extension of the property.

Recommendation 13: Undertake a specialist study on the hydrological regime of the floodplain, which should inform the subsequent EIA for the proposed Kito-1 oil and gas exploration site in the Kilombero Valley Floodplain. The EIA should comprehensively assess potential downstream environmental impacts on the OUV of the property. Both the specialist study and the EIA should be submitted to the World Heritage Centre for review by IUCN, before permitting the drilling to proceed and prior to taking any decision that may be difficult to reverse, in accordance with Paragraph 172 of the *Operational Guidelines*.

Recommendation 14: Rapidly consider developing a strategic plan and interventions to secure a long-term solution that will ensure livestock grazing does not become a serious threat to the OUV of the property.

Recommendation 15: Continue to monitor the property for invasive alien species (IAS) and include specific IAS management control strategies in the revised General Management Plan and to ensure resources and time are put in place for their effective implementation.

1. Background to the mission

1.1 Inscription history

Selous Game Reserve World Heritage property (the property) covers a vast area of approximately 50,000 km^2 and at the time of inscription on the World Heritage List in 1982, retained undisturbed on-going ecological and biological processes, which sustained a wide variety of species and habitats. The property is part of the larger 90,000 km^2 Selous Ecosystem, which includes national parks, forest reserves and community managed wildlife areas. In addition the property is ecologically linked with the 42,000 km^2 Niassa Game Reserve in Mozambique.

In 2012 the World Heritage Committee (the Committee), in an exceptional and unique case, accepted a minor boundary modification of the property to excise ca. 400 km^2 (0.8%) of the property area to facilitate uranium mining. The boundary of Selous Game Reserve (SGR) has remained unchanged since 2012.

The property was inscribed on the List of World Heritage in Danger in 2014 due to the high levels of poaching and the ensuing dramatic decline in the elephant population, representing a clear ascertained danger to the OUV of the property, in line with Paragraph 180 of the *Operational Guidelines*.

1.2 Inscription criteria and World Heritage Values

The justification for the inscription of the property under criteria (ix) and (x) is as follows:

- Criterion (ix): The Selous Game Reserve is one of the largest remaining wilderness areas in Africa, with relatively undisturbed ecological and biological processes, including a diverse range of wildlife with significant predator/prey relationships. The property contains a great diversity of vegetation types, including rocky acacia-clad hills, gallery and ground water forests, swamps and lowland rain forest. The dominant vegetation of the reserve is deciduous Miombo woodlands and the property constitutes a globally important example of this vegetation type. Because of this fire-climax vegetation, soils are subject to erosion when there are heavy rains. The result is a network of normally dry rivers of sand that become raging torrents during the rains; these sand rivers are one of the most unique features of the Selous landscape. Large parts of the wooded grasslands of the northern Selous are seasonally flooded by the rising water of the Rufiji River, creating a very dynamic ecosystem.

- Criterion (x): The reserve has a higher density and diversity of species than any other Miombo woodland area: more than 2,100 plants have been recorded and more are thought to exist in the remote forests in the south. Similarly, the property protects an impressive large mammal fauna; it contains globally significant populations of African elephant (*Loxodonta africana*) (106,300), black rhinoceros (*Diceros bicornis*) (2,135) and wild hunting dog (*Lycaonpictus*). It also includes one of the world's largest known populations of hippopotamus (*Hippopotamus amphibius*) (18,200) and buffalo (*Syncerus caffer*) (204,015). There are also important populations of ungulates including sable antelope (*Hippotragus niger*) (7,000), Lichtenstein's hartebeest (*Alcelaphus lichtensteinii*[1]) (52,150), greater kudu (*Tragelaphus strepsiceros*), eland (*Taurotragus oryx*) and Nyassa wildebeest (*Connochaetes albojubatus*[2]) (80,815). In addition, there is also a large number of Nile crocodile (*Crocodilus*

[1] The scientific name of this species has changed to *Alcelaphus buselaphus lichtensteinii*. Souce: IUCN SSC Antelope Specialist Group. 2016. *Alcelaphus buselaphus*. The IUCN Red List of Threatened Species 2016: e.T811A50181009. Downloaded on 06 April 2017.

[2] The scientific name of this species has changed *Connochaetes taurinus johnstoni*. IUCN SSC Antelope Specialist Group. 2016. *Connochaetes taurinus*. The IUCN Red List of Threatened Species 2016: e.T5229A50185086. Downloaded on 06 April 2017.

niloticus) and 350 species of birds, including the endemic Udzungwa forest partridge (*Xenoperdix udzungwensis*) and the rufous winged sunbird (*Nectarinia rufipennis*[3]). Because of this high density and diversity of species, the Selous Game Reserve is a natural habitat of outstanding importance for in-situ conservation of biological diversity.

1.3 Integrity issues at the time of inscription

At the time of inscription in 1982, the size of the game reserve was considered to be sufficiently large in order to absorb most pressures on the site.

In 2012 when the property was evaluated for its minor boundary modification proposal, IUCN noted a number of concerns to the property in relation to its integrity. Firstly, the proposed size of the Mkuju uranium mine raised questions on the impact on the OUV through direct, indirect and secondary impacts. Secondly, the need to strengthen efforts to effectively protect the Selous-Niassa corridor was emphasised for long-term ecological integrity.

1.4 Examination of the State of Conservation by the World Heritage Committee

The Committee first expressed its concerns for the alarming decrease in rhino and elephant populations as a result of poaching at its 10th session (Paris, 1986), and this has been one of the key threats that led to regular examinations by the Committee, leading to the inscription of the property on the List of World Heritage in Danger in 2014 (Decision **38 COM 7B.95**).

In 2016 (Decision **40 COM 7A.47**), the Committee commended the State Party and its international partners for their efforts in addressing the poaching crisis. Gaps in elephant population data were noted as well as the State Party's on-going effort to undertake further studies. The situation of black rhinos has remained uncertain however, and the Committee requested the State Party to undertake an analysis to estimate the number of rhino left in the property.

Since 2006, the Committee has recognised a number of additional significant threats to the property and has been examining the case annually. Funding, management effectiveness, tourism development and oil and gas concessions have been some of the factors affecting the property. Uranium mining in particular led to the exceptional circumstance for the Committee to adopt a minor boundary modification to excise an area from the World Heritage property in 2012 under several conditions. Such conditions included requests to the State Party to ensure enhanced and effective protection of the Selous-Niassa corridor, commitment to not engage in any mining activity within the property after exclusion of the Mkuju River Project uranium mining site, and to provide additional valuable wildlife forest area to compensate for the excised area (Decision **36 COM 8B.43**).

The proposed development of Stiegler's Gorge Hydroelectric Dam inside the property and Kidunda Dam in the immediate vicinity of the property, have also been under serious scrutiny. Both projects would lead to inundation within the property as well as changes to hydrological flow regimes, although the exact extent has been changeable due to evolving project descriptions and lack of clarity on their status. In 2011 nevertheless, the Committee urged the State Party to abandon the Stiegler's Gorge Dam project as it would constitute an ascertained danger to the OUV of the property in accordance with paragraph 180 of the *Operational Guidelines* (Decision **35 COM 7B.6**). This request has been repeatedly reiterated by the Committee as well as requests to clarify the status of planning and decision-making.

[3] The scientific name of this species has changed to *Cinnyris rufipennis*. Source: BirdLife International (2016) *Cinnyris rufipennis*. The IUCN Red List of Threatened Species 2016: e.T22717954A94559530. http://dx.doi.org/10.2305/IUCN.UK.2016-3.RLTS.T22717954A94559530.en. Downloaded on 06 April 2017.

1.5 Justification for the mission

At its 40th session (**40 COM 7A.47**), the Committee requested the State Party of Tanzania to invite an IUCN Reactive Monitoring mission *"in order to evaluate progress in combating poaching, and to assess the current status and likely impacts of the proposed In Situ Leaching at the Mkuju uranium mine, the Stiegler's Gorge and Kidunda dam projects, and prospecting licenses overlapping with and adjacent to the property, as well as any other development that might impact the OUV of the property"*.

The mission comprised Ms Mizuki Murai and Mr Roger Porter representing IUCN. The terms of reference of the mission, its itinerary and programme and list of individuals met can be found in the annexes.

2. National policy for the preservation and management of the World Heritage property

The SGR was managed by the Wildlife Division of the Ministry of Natural Resources and Tourism (MNRT), but since the inauguration of the autonomous Tanzania Wildlife Authority (TAWA) under MNRT, all responsibilities now lie with TAWA. SGR is divided into eight management sectors, of which only the Northern sector is designated for photographic tourism, the other seven (which are further broken down into 42 blocks) are hunting sectors. Adjoining and surrounding SGR in the larger Selous ecosystem are 10 Wildlife Management Areas (WMAs), ranging in size from around 500 km^2 to 4,500 km^2 (See Annex 6.4 Figure 1).

SGR derives its legal status from the Wildlife Conservation Act (WCA) of 1974, as amended by the Wildlife Conservation (Amendment) Act in 1978 and 2009.

Additional laws and regulations relevant to the management of the property include but are not limited to the Tanzania Mining Act (2010), Electricity Act (2008), the Energy and Water Utilities Regulatory Authority Act (2001), the Water Resources Management Act (2009), the Environmental Management Act (2004) and the associated Environmental Impact Assessment and Audit Regulations (2005) and the Strategic Environmental Assessment Regulations (2008).

Wildlife censuses of SGR are undertaken and analysed by another autonomous institution within MNRT, the Tanzania Wildlife Research Institute (TAWIRI). The Rufiji Basin Development Authority (RUBADA) is responsible for the management of the Rufiji River Basin, which overlaps with the SGR.

No other international designations overlap with the property, but the Kilombero Valley Floodplain Ramsar site is located to the west of the property.

3. Identification and assessment of issues/threats

3.1 Management of SGR

3.1.1 Tanzania Wildlife Authority

The Tanzania Wildlife Authority (TAWA) was established in 2015 as a parastatal institution and became operational in July 2016 to manage the 28 game reserves, 47 game controlled areas, Ramsar sites and wildlife outside of protected areas in the country. TAWA's establishment covering

governance, administration, financial management, development and operational activities has been achieved in a very short period. The executive of TAWA reports to a Board of Directors and its governance, administration, and conservation practice is undertaken in accordance with the Wildlife Conservation Act No. 5 of 2009.

The General Management Plan (GMP) for the property covers the period from 2005 to 2015, and is therefore out of date. This constitutes a major gap in ensuring the protection of the property and it should therefore be considered by TAWA as the utmost priority to: (i) evaluate the 2005-15 GMP to assess the degree of achievement of all management objectives in the GMP and to identify the revised and additional management actions and interventions that are to be included in a new updated GMP; and (ii) subsequently produce a revised and updated GMP for adoption and implementation. A strategic plan for TAWA for the next five years is currently being developed, which should help prioritise the activities and guide the actions of the institution, which as a new organisation, is reportedly heavily under-resourced. Given these two processes, it is important to ensure that the GMP will be aligned with the strategic plan.

The future of the revenue retention scheme and the current retention at SGR had recently been unclear but since the establishment of TAWA, the 50% retention has been reintroduced. The income derived largely from trophy hunting and to a lesser degree from photographic tourism, is retained for operational activities by TAWA. It is important to note that staff salaries are not paid from this income source, which is used exclusively for operational expenses.

Recommendation 1: Evaluate the 2005-15 General Management Plan for Selous Game Reserve (SGR) and produce a revised Plan for the next five years as a matter of priority. This Plan should be aligned with TAWA's Strategic Plan, which is currently undergoing development. Copies of both Plans should be submitted to the World Heritage Centre once they have been completed.

3.1.2 Anti-poaching

Animal population censuses have indicated a significant decline in the elephant population between 2005 and 2013. As a result in 2013, the Tanzanian Government called for 'Operation Tokomeza' in order to address the threat and reverse the trend.

A national Wildlife Crime Unit (WCU) has been established under MNRT that works with security forces (both police and the military) and the Ministry of Finance to combat illegal wildlife trafficking activities by coordinating intelligence-led policing to intercept between the criminals that obtain the financial rewards of wildlife crime and the supply of illegal commodities (ivory) to the black market. WCU operates within the requirements of the 2014 national strategy to combat poaching and illegal wildlife trade[4] by working in partnership with TAWA and Interpol. Such efforts have led to the arrest of the notorious 'Ivory Queen' in recent years and more than 200 people allegedly associated with illegal international ivory trade. Memorandums of Understanding (MoUs) have been signed with China to control the illegal import of ivory originating from Tanzania, and also with Mozambique through a WWF partnership effort to strengthen the border control of contraband and protect the cross boundary Selous-Niassa corridor.

Anti-poaching efforts have increased markedly within the property, which has seen a corresponding increase in the number of poachers captured (194 in 2010/11 to 394 in 2015/16), a decrease in firearms recovered (ca. 45 in 2010/11 to 28 in 2015/16) and a decrease in the number of elephant carcasses found (ca. 75 in 2010/11 to 17 in 2015/16). Since December 2014, Frankfurt Zoological

[4]Ministry of Natural Resources and Tourism (2014) National Strategy to Combat Poaching and Illegal Wildlife Trade. 30th October 2014. The United Republic of Tanzania.

Society (FZS) has supported anti-poaching operations in SGR, such as through provision of equipment and resources to improve aerial and ground patrols. According to TAWA, ground patrol efforts have more than doubled from 714 patrol days in 2010/11, to 1,865 in 2015/16. The number of poachers arrested during the same period increased from 194 to 394.

TAWA intends to shift their system of monitoring ground patrols by moving from patrol days to area coverage. The plan in the next two years is to reach 80% area coverage of SGR, and to intensify surveillance efforts in identified 'hotspot' areas. Data loggers (currently being developed through the Spatial Monitoring and Reporting Tool (SMART)) will be used to monitor and evaluate these patrols and the areas traversed by recording routes taken, and observations made including carcases of dead animals, signs of poaching activities, incursions of cattle, etc. Application of the Management Effectiveness Tracking Tool (METT) will allow for regular performance assessments and strategic readjustments of management activities and interventions by SGR staff.

In addition to the above-mentioned initiatives on anti-poaching, other projects are in the pipeline to further enhance anti-poaching efforts, including a five-year KfW (German development bank) funded project expected to start later in 2017, which amongst a number of objectives, aims to strengthen anti-poaching and law enforcement through supply of modern communication equipment and training of field rangers in patrolling, law enforcement, and court procedures. The implementing partners, FZS and WWF-Tanzania, have contracts in place with MNRT. Considering the set duration of the project, it would appear to be equally important for the NGOs to incorporate sustainability plans for anti-poaching for post-project closure.

An MoU was also signed between Mantra and MNRT in 2014, which called for close cooperation in anti-poaching activities. As part of the agreement Mantra initiated its support for anti-poaching patrols to cover an area of 1,000 km^2 in the south of SGR around the Mkuju River Project.

Recommendation 2: Rigorously and regularly apply the Management Effectiveness Tracking Tool (METT) in particular to assess effectiveness of anti-poaching activities as ground and aerial patrol monitoring technologies are applied and implemented.

Recommendation 3: Plan for continuity of the existing and planned conservation projects in the property and the wider Selous ecosystem with donors and implementers to prevent post-project collapse or decline at the end of the projects.

3.1.3 Elephant, buffalo and black rhinoceros censuses

The status of the elephant (*Loxodonta africana*) population is assessed using the Systematic Reconnaissance Flight (SRF) method of counting and analysis which is applied in a standard, structured and rigorous way using three observers and flying transects in a light aircraft that cover the whole of SGR. The latest census conducted in 2014 estimated a population of around 15,200 in the Selous-Mikumi ecosystem, of which around 11,400 elephants were estimated for SGR[5]. During these flights the number of elephant carcases was also recorded as an indicator of mortality, which suggested a decline in elephant deaths compared to the 2013 data.

It should be clarified that the elephant population at the time of inscription on the World Heritage List was incorrectly defined. Although the Statement of OUV (SOUV) states that the population of elephants within SGR is more than 100,000 individuals, it was clarified during the mission that this was in fact, the number of elephants in the Selous ecosystem. The number of elephants inside SGR is

[5]Tanzania Wildlife Research Institute (2015) *Population Status of Elephant in Tanzania 2014*. TAWIRI Aerial Survey Report.

not available but it is estimated to be much lower than this figure. Nevertheless, it is undeniable that the elephant population has suffered a tremendous decline. Much effort is needed to secure the site from poaching but when considering the scale of the recovery programme, it is crucial to ensure differentiation between the historical elephant populations within SGR and the Selous ecosystem.

Another complexity with regards to population recovery is in determining whether the population is on the increase or not. TAWA, TAWIRI and MNRT pointed to a number of errors that need to be factored in from census to census, such as the movement of elephants and the detection probability (especially when considering the thick Miombo woodlands). The limitations of aerial surveys have also been studied in a number of peer-reviewed journals[6,7] and noted in the 2012 elephant monitoring manual[8] that detection and spatial sampling are critical issues. Although the SRF method can provide a rough population abundance estimate at best, use of imprecise data can lead to erroneous conclusions about elephant population status and trend. The mission considers that the SRF method does not generate data sufficiently accurate to be used as an indicator to determine population trend, and that a demographic study is essential to understand population structure and growth. In this respect, the mission was informed that the State Party, in collaboration with FZS, is planning to undertake a demographic study under a KfW funded Selous Ecosystem Conservation and Development (SECAD) project, but the mission notes that there are no plans to link this demographic study to the Desired state of conservation for the removal of the property from the List of World Heritage in Danger (DSOCR).

The Selous-Niassa Wildlife Corridor (SNWC) is believed to be an important conservation area, including for elephants. A 2009 study by TAWIRI[9] defined the SNWC as a known animal movement route between two protected areas. However, it is not clear whether elephants seasonally migrate between SGR and Niassa Game Reserve (NGR) in Mozambique. One of the findings from the 2014 elephant aerial census for example, was that the movement patterns of elephants in the ecosystem was still poorly understood, and recommended that satellite collar tracking of individuals is undertaken. With increasing pressure on connectively and isolation of protected areas, including SGR and NGR[6], there is a need to better understand the conservation value and importance of SNWC. In order to address this, WWF-Tanzania is set to commence a study from March 2017 whereby satellite linked transmitters will be fitted on elephants to determine elephant movement.

Furthermore, through the facilitation of WWF-Tanzania and WWF-Mozambique, an MoU between the States Parties of Tanzania and Mozambique has been signed to protect the forests and wildlife in the SNWC, and transboundary illegal wildlife trade is also being addressed.

The status of buffalo (*Syncerus caffer*) population is assessed as part of the elephant census using the same SRF methodology. Similarly to elephant, buffalo population in SGR has also fluctuated over the last couple of decades, with a significant decline between the 2002 census (where 159,098 individuals were recorded) and the 2006 census (where 70,835 individuals were recorded). In the last census in 2014, a total count of 72,000 buffalo was recorded within SGR, with the presence of a relatively large number of calves noted by the mission. Although the buffalo census is intended to act as an indicator for the population status of other herbivores in general in the property, the mission considers that such an assumption needs to be taken with utmost care as ecosystem

[6]Caughley G (2014) *Bias in aerial survey*. The Journal of Wildlife Management, 38(4), 921-933. DOI: 10.2307/3800067.

[7]Ferreira SM & van Aarde RJ (2009) *Aerial survey intensity as a determinant of estimates of African elephant population sizes and trends*. South African Journal of Wildlife Research, 39(2), 181-191.

[8]Hedges S (Ed.) (2012) *Monitoring elephant populations and assessing threats: a manual for researchers, managers and conservationists*. Universities Press.

[9] Jones T Caro T & Davenport TRB (Eds.) 2009. *Wildlife Corridors in Tanzania*. Unpublished report. Tanzania Wildlife Research Institute (TAWIRI), Arusha.

dynamics as well as some types of threats e.g. bushmeat hunting may be targeting other species of ungulates and therefore may not be represented by growth in the buffalo population. Populations of the important ungulate species in the property, as specified under criterion (x), therefore needs to be monitored. These include sable antelope (*Hippotragus niger*), Lichtenstein's hartebeest (*Alcelaphus buselaphus lichtensteinii*), greater kudu (*Tragelaphus strepsiceros*), eland (*Taurotragus oryx*) and Nyassa wildebeest (*Connochaetes taurinus johnstoni*). Note that the SOUV does not correctly provide the scientific names of the hartebeest and wildebeest.

TAWA staff confirmed the presence of the sub-species of black rhinoceros (*Diceros bicornis minor*) in the property through detection of direct and indirect signs, but estimates are very low at around 30 to 50 individuals based on field ranger reports. TAWA is currently in the process of updating the 2010-2015 Rhino Management Plan. It was noted that one of the actions from this previous Management Plan was to establish a rhino unit, but this not yet been completed, and will be added to the updated Plan.

Recommendation 4: Conduct a scientific study of the elephant population demography in SGR to determine its age and sex structure including ageing of calves of <1 to approximately 6 years old, in order to determine the population growth. This will be a critically important indicator in support of any future proposal for the removal of the property from the List of World Heritage in Danger.

Recommendation 5: Undertake a research project to determine the size of the black rhinoceros population, its age and sex structure within the property. Building on the findings, it may be necessary to undertake a genetic study to determine the viability of the population, and thereby inform subsequent decision-making of the introduction of new genetic stock of this sub-species from sources elsewhere, provided that poaching is brought sufficiently under control to ensure the security of any released rhino.

Recommendation 6: Determine and undertake population monitoring of selected herbivore species populations to determine trends in relation to the species (and subspecies) specified in the Statement of Outstanding Universal Value (OUV) of the property.

3.1.4 Wildlife Management Areas

Ten Wildlife Management Areas (WMAs) have been established in the Selous ecosystem, which function largely as dispersal areas for wildlife and provide an added layer of protection to SGR. These WMAs aim to transfer management responsibility to local communities and create an *'enabling environment which ensures that legal and sustainable wildlife schemes directly benefit local communities'*[10]. WMA is considered a land use type (i.e. it excludes other land-uses such as industrial and intensive agriculture), and is a village-led initiative that is administered by the Wildlife Division. There is no legislation to limit the type of tourist activities allowed in the WMAs but they are in general, opened for trophy hunting (the quota for which is provided by the Wildlife Division and compliance monitored), the revenue of which funds the development and maintenance of the villages. This is a commendable concept in principle that the State Party has introduced and has been successful in some of the WMAs.

The mission notes nevertheless that WMAs face significant challenges including inadequate financial support, poaching of wildlife, insufficient equipment and weak governance. The Village Game Scouts (VGS) have however been successful in anti-poaching activities in recent years with the recovery of

[10] Tanzania Authorised Association Consortium (AAC) <http://www.twma.co.tz/twma/about>. Accessed 27 February 2017.

poached ivory and illegally owned firearms. Unfortunately these VGSs have received only very basic training with limited equipment to undertake what is essentially the role of a SGR ranger.

The market for trophy hunting (particularly elephant and lion) is on the decline and hence there is a need for game reserves and WMAs to explore sustainable options moving forwards. In WMAs the key issue is that experience amongst the local communities in other tourism schemes is lacking. Although photographic tourism is one of the land use options, there is the added complexity of competing with other protected areas such as the world renowned Serengeti National Park and Ngorongoro Conservation Area in northern Tanzania. WMAs therefore require much more support than they are currently given, not only to tackle poaching and other illegal activities, but in order to develop a financially sustainable model that can be managed effectively by local communities that will enhance the protection of the World Heritage property.

The 2012 Wildlife Conservation (WMAs) Regulations[11] includes a section on the management of WMAs, and requires that the village council prepares a Land Use Plan and that an Authorized Association prepares a General Management Plan, amongst others. From the information provided to the mission however, there did not appear to be a Management Plan in place for the WMAs.

One of the project components under the KfW project to be implemented by WWF-Tanzania, is on strengthening WMAs and the SNWC. This will involve supporting the setting up of WMAs and positioning them as sources of intelligence and training of VGSs amongst others.

Recommendation 7: Produce a Management Plan for each of the 10 Wildlife Management Areas (WMAs) in the wider Selous ecosystem in line with the 2012 Wildlife Conservation (WMAs) Regulation. Such a Plan should include explicit interventions and activities that would strengthen the conservation management of each of these areas.

3.2 Proposed dam developments

3.2.1 Kidunda Dam

A final ESIA for the three components of the Kidunda Dam – road access, energy transmission line and the dam – is being finalised to incorporate previous Committee Decision requests on a specific assessment of impacts on the OUV of the property (**40 COM7A.47**). The mission can therefore not comment on the final ESIA and thereby any impacts or mitigation measures with respect to the OUV.

The mission nevertheless, was able to meet with some relevant authorities such as the Ministry of Water and Irrigation, Dar es Salaam Water and Sewage Authority (DAWASA) and the National Environmental Management Council (NEMC) on the current progress towards finalising the ESIA, the potential impact of the project and clarifications on the scope of the proposal. The Kidunda Dam will be built on the Ruvu River as an impoundment to provide a consistent water supply to Dar es Salaam (population of approximately 5 million) for domestic use. The project comprises of water treatment plants and pumping stations as well as a small-scale energy generation component in the region of 35 MW, in order to pump the water to Dar es Salaam. An ESIA has not yet been approved by NEMC, as it is pending finalisation and stakeholder consultation, which includes the World Heritage Centre and IUCN.

[11] The United Republic of Tanzania. The Wildlife Conservation Act. The Wildlife Conservation (Wildlife Management Areas) Regulations, 2012. Downloaded from https://tnrf.org/files/WMA%20regulations%202012.pdf.

The project design has reportedly been finalised and is expected to take between 4 and 5 years to reach full supply level, which will flood a total surface area of 55 km^2. Modelling estimates the maximum surface area to be inundated within the property will be around 4.5 km^2.The area that will be affected by this project is considered to affect wildlife movement to the Gonabis Wetlands and the migration corridor between SGR and Wami-Mbiki WMA to the north. In order to mitigate impacts, the State Party is in the process of preparing an alternative corridor of 2 km width, downstream of the dam wall (see Annex 6.4 Figure 2), which would reportedly reconnect SGR with the rest of the wildlife corridor on the other side of the reservoir. The State Party has compensated communities that were relocated and that could be affected downstream, reportedly following the World Bank resettlement policy including stakeholder consultation processes.

With respect to the OUV of the property, the mission considers that there are two key factors that need to be considered in the Environmental Impact Assessment (EIA), which appear not to have been investigated or determined to date; firstly the frequency of partial flooding or inundation, and secondly, the duration of flooding before water levels drop beyond the boundaries of the property. This area is mostly wooded grassland and grassland vegetation types, and therefore these habitats would be lost to inundation caused by the dam as well as impacting on ground-dwelling animals which will either be displaced or drowned should the dam be filled to its full supply level. These data are therefore important for determining the future operational management of the dam in order to avoid, minimise, or reduce the negative impacts of inundation by flooding on biodiversity in the property, in particular woody plant habitats.

Recommendation 8: Consider a project design for Kidunda Dam that will not inundate any part of the property at full supply level. Should this not be possible, then noting the greater concern for the project and to determine its acceptability in line with the World Heritage status, develop and incorporate into the ESIA for submission to the World Heritage Centre for review by IUCN, a model of the frequency, extent and duration of the flooding regime inside the property, resulting from the proposed Kidunda Dam, and determine survival tolerance levels of woody vegetation species to duration of inundation.

3.2.2 Stiegler's Gorge Hydropower Project

The recent Committee Decisions have requested clarifications from the State Party on the current status of the Stiegler's Gorge Hydropower project (Stiegler's Gorge Dam) and have made a firm request to the State Party to abandon the project due to its potential impact on the OUV of the property. Nevertheless, such clarification or commitment had not been given and Stiegler's Gorge Dam has recently been included in the updated 2016 National Power System Master Plan[12] for Tanzania.

The mission was able to receive clarification on the current status of development of the Stiegler's Gorge Dam from the relevant authorities including Ministry of Energy and Minerals (MEM), MNRT and RUBADA. Firstly, the mission considers it important to clarify that the project, which has existed since 1984, remains at a conceptual stage, with little, if any, investigations being undertaken that would lead to a project description. By law, a project proponent must follow due process as defined by NEMC.

The first step of such a process requires the project proponent to submit a scoping and feasibility study to NEMC, at which point they officially register the project. Once accepted by NEMC, the project proponent must then proceed to undertake an EIA. This EIA is reviewed by NEMC, and NEMC subsequently carries out stakeholder consultations. NEMC confirmed the World Heritage Centre and

[12] United Republic of Tanzania, Ministry of Energy and Minerals: Power System Master Plan 2016 Update.

IUCN as key stakeholders in this regard. Therefore, should this project eventually reach this step in the process, NEMC will only proceed further once all comments from all stakeholders have been collated. The final stage of the process is for NEMC to submit the EIA along with stakeholder feedbacks, which may include objections for the project, to the Minister of Environment, who will make the final decision. If the project is to go ahead then an Environmental Certificate is issued. An Environmental Certificate will include a set of conditions to which the project proponent must comply, and NEMC monitors this compliance. If the project proponent does not abide to the conditions, the project proponent must provide an explanation to NEMC on the timeline for compliance. Should the conditions not be fulfilled, the project proponent will be penalised.

It should be clarified that the project implementer, Odebrecht, commissioned a situation analysis report of the initial scoping process of the Stiegler's Gorge Hydropower project, which is now available. However this is not one of the official processes towards obtaining an environmental certificate and this report has not been submitted to NEMC, hence the project is not yet officially on record.

The second contract between RUBADA and Odebrecht ended in November 2016 and a new MoU has been signed to extend the contract for the third time for an additional three years in order for Odebrecht to undertake a feasibility study and an EIA. Regrettably, the mission was unable to meet with Odebrecht to confirm their plans for undertaking both studies in the given time. According to the authorities with whom the mission met, there was a clear consensus that it would be highly unlikely for an EIA to be undertaken within the next three years considering the current stage in the project design and the due process that needs to be followed before a project proponent may start an EIA.

As a country Tanzania has an urgent need to generate electrical power, with targets to increase electricity generation from 1,500 MW (in 2015) to 4,900 MW by 2020, which would improve electricity connection from 36% to 60% of the population in the same period, according to the Power System Master Plan. The Master Plan outlines Tanzania's vision on sources of energy for the next 25 years as follows: 40% natural gas, 35% coal, 20% hydropower, and 5% renewable (solar and wind) and others. Tanzania has a considerable gas store both onshore and offshore, and a recent discovery of further onshore gas store puts the total estimated recoverable natural gas reserves to more than 57 trillion cubic feet[13]. Although this volume would be sufficient to satisfy both domestic needs and for export, the government has yet to determine the strategic uses for these resources, which would include some use for power generation, but may also be used to manufacture fertilisers and petrochemicals according to the relevant authorities with whom the mission met. Therefore whilst a significant volume of gas may be available, the State Party does not consider using predominantly one energy source as an option.

In the Power System Master Plan, there are approximately ten hydropower projects that have been identified in addition to Stiegler's Gorge Dam. The representatives of MEM with whom the mission met, clarified that Stiegler's Gorge Dam is therefore not a priority for the country and is only considered as a back-up option should all other options fail. While this may reduce the probability of the project being realised, the mission notes with concern that the State Party continues to keep the project possibility open despite the significant impact it will have on the OUV of the property due to the very nature of a large-scale dam in the middle of a natural World Heritage site, and clearly not being in line with the Committee's position that *"[…]the construction of dams with large reservoirs within the boundaries of World Heritage properties is incompatible with their World Heritage status […]"* (Decision **40 COM 7**). Furthermore it is possible to deduce the considerable adverse socio-economic and environmental impacts the dam could have both upstream and downstream.

[13]Tanzania in need of $46 billion in power investment by 2040.The Guardian. 7 February 2017.

Currently available literature and reports all point to the potential detrimental impacts of the Stiegler's Gorge Dam should it be built. One such example is the 2017 Strategic Environmental and Social Assessment (SESA) for the Integrated Water Resources Management and Development (IWRMD) Plan for the Rufiji Basin[14], in which it reports the Rufiji Delta to supply more than 80% of the prawns caught in Tanzania. The deposition of riverine sediment is one of the key features of a shrimp ecosystem and the SESA notes with concern that the construction of the Stiegler's Gorge Dam would substantially decrease the sediment supply to the Delta downstream. The altered hydrological flow regime and the ecological balance of the estuary therefore, could lead to a collapse in the prawn, shrimp and fishing industry in the Rufiji Delta. The SESA elaborates further by concluding that *"it would be difficult, if not impossible to reduce the impact significance any further since there will inevitably be trade-offs between power generation, biodiversity conservation, fisheries, water users and the environment"*.

The mission viewed the potential project site in a light aircraft at 600 ft and noted that much of the immediate downstream component of the river were floodplains. The development of such a large-scale dam will therefore completely reconfigure the landscape and the functioning of the ecosystem. As previously noted in State of Conservation (SOC) reports[15], the reservoir for the dam will inundate a major part of the reserve in the heart of the World Heritage property.

Considering the abovementioned insight into the current status of the Stiegler's Gorge Dam, the mission considers that the project is not ready to undergo an EIA at this present moment, as has been requested previously by the Committee (Decisions **38 COM 7B.95**, **40 COM 7A.47**) due to the lack of clarity previously received from the State Party. The project is fatally flawed because of its unacceptable impacts on: (i) the OUV of the property; and (ii) downstream land-uses, commercial fishing and agricultural industries, and the livelihood of communities. This project should therefore be abandoned and alternative projects preferentially pursued.

Recommendation 9: Permanently abandon the Stiegler's Gorge Hydropower project due to its obvious foreseeable adverse impact on the OUV of the property, and in line with the Committee's position that the construction of dams with large reservoirs within World Heritage properties is incompatible with their World Heritage status, and pursue alternative options located outside of the property boundaries that will not impact on its OUV.

3.3 Extractive Industries

3.3.1 Uranium mining at Mkuju River Project

The status of the Mkuju River Project (MRP) and the methodology to be applied has been an outstanding question from the recent Committee Decisions (**38 COM 7B.95**, **39 COM 7A.14**, **40 COM 7A.47**). The mission met with the project operator, Mantra-Tanzania Limited (Mantra), as well as MEM and the Tanzania Atomic Energy Agency (TAEA) to obtain clarity on these issues.

The mission was informed that the low uranium prices since the Fukushima Daiichi nuclear disaster in 2011 has affected the planned operations and Mantra had suspended decision making to wait for uranium prices to become more favourable.

[14] Government of the United Republic of Tanzania (2017) Strategic Environmental and Social Assessment: Integrated Water Resources Management and Development (IWRMD) Plan for the Rufiji Basin. Final Report. January 2017.

[15] UNESCO (2013) Report of the World Heritage Centre and IUCN on the state of conservation of Selous Game Reserve (Tanzania), State of Conservation Information System of the World Heritage Centre. http://whc.unesco.org/en/soc/1873 (Accessed 10 March 2017).

Mantra has nevertheless continued to progress in establishing baseline data and is now in the process of testing the feasibility and suitability of in-situ leaching (ISL – also called in-situ recovery ISR). To date, groundwater tests have been conducted on water samples taken from a series of monitoring wells in the vicinity of a point of injection and a point of extraction. Baseline uranium content in dust has been established through measuring of radionuclide concentrations over a period of a few years at 10 points spread over a distance extending beyond the lease area. Since 2011, 56 bore holes within the lease area (i.e. a wider area than the proposed uranium extraction site) have been monitored, producing quarterly hydrological data for analysis. In addition 18 surface monitoring points are in place; 3 of which monitor continuously, and the remaining 15 are used seasonally. A final technical report on the results of these tests is due in March 2017, which will inform the next steps of the project.

Tests to identify the best solvent to extract uranium-238 isotope have been undertaken. Test results from using solutions of sodium carbonate, hydrogen peroxide and sulphuric acid, showed that the latter was the best option, at a concentration of 5 mg/litre. The dissolved uranium solution is drawn up to the surface in the ISL method as a "yellow cake". However, Mantra is continuing to explore other alternative extraction methods. Instead of transporting liquid sulphuric acid to the mine the much safer transport option of granular sulphur is being considered, where the acid could be manufactured at the mine. There is also the added advantage of the resulting exothermic reaction producing heat which will then be used to generate electricity for use at the mine.

The ISL method relies on a push-pull mechanism, which is based on a closed-loop system that uses extremely high pressure to extract the yellow cake up to the surface (see Annex 6.4 Figure 3). This methodology has now been tested at a single site, which included one insertion well to inject the sulphuric acid solution, and an extraction well six meters away at a force five times greater than the insertion pressure (see Annex 6.4 Figure 4). Results reportedly showed that 100% of the input solution containing uranium was recovered. The test site also included six monitoring pipes located at varying distances around the insertion pipe to detect presence of sulphuric acid. These test pipes were monitored over time but apparently did not detect any acid, except for those pipes situated very close to the insertion pipe. Mantra therefore considers this method as being environmentally safe and that it would not contaminate below ground aquifers, however, the mission notes the critical importance of rigorously assessing the potential impacts in the ESIA.

Further tests are required to determine the applicability of using this method at MRP, but it should be noted that ISL is only an option where the uranium ore is situated below an aquifer. Mantra has established that the positioning of the uranium ore differs across the concession site. Therefore, it is Mantra's conclusion that, should the project go ahead and ISL is proved feasible, both ISL and open-cast methods of mining will be used accordingly. It should be noted, that Mantra is continuing to explore alternative mining methodologies and hence more methodologies, in addition to ISL and open-cast may be adopted.

Once Mantra has decided on which mining methods will be used, an ESIA will be conducted as required by the World Heritage Convention and NEMC. Mantra confirmed that mining will not commence before the ESIA has been completed and reviewed by the relevant stakeholders. The mission notes that the ESIA should include detailed mitigation measures and an early warning system in the case of an accident or to detect seepages, and ensure that the EIA is in line with the IUCN World Heritage Advice Note on Environmental Assessment[16]. It is critical that it also factors in long term decommissioning and environmental monitoring following the mine closure.

[16]IUCN (2013) World Heritage Advice Note on Environmental Assessment. Available from: https://cmsdata.iucn.org/downloads/iucn_advice_note_environmental_assessment_18_11_13_iucn_template.pdf

To date Mantra appears to be undertaking these investigations in compliance with international protocols regulating personnel and environmental protection requirements including the International Atomic Energy Agency (IAEA), United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) and the International Commission on Radiological Protection (ICRP). Although an IAEA mission to Tanzania in 2015 concluded that '*[…] TAEC faced several challenges in building an independent nuclear regulator […]*'[17] it appears that independent monitoring and data analyses of radiation and contamination levels are now being undertaken by TAEA and IAEA. Laboratory analyses are carried out by SGS-Tanzania, which is an international company providing independent inspection, verification and testing services. All activities require authorisation by the regulatory authority, MEM. To date results obtained from monitoring sites show very low levels of radiation i.e. 0.2 micro Siemens (international limit is 10.0 micro Siemens). Adverse impacts to vegetation, wildlife and surface water resources is minimised or not significant and in compliance with ISO 14001 requirements. However, noting that uranium can decay to form radium-238 and subsequently radon gas then polonium-210, all of which are radioactive and will release alpha, beta and gamma radiation in the decay process[18,19], it is important to ensure that the ESIA also carefully assesses their potential impacts and mitigation measures.

Recommendation 10: Should In Situ Leaching (ISL) be considered as a possible methodology for uranium ore extraction at Mkuju River Project (MRP), it should be ensured that the ESIA comprehensively addresses the following:

a) the potential impacts and mitigation measures of using the ISL approach, which includes a thorough assessment of the radioactive decay products of uranium;
b) an early warning system in the case of an accident or seepage and an emergency response to such events;
c) a long term plan for decommissioning and environmental monitoring following the mine closure;
d) all direct and indirect impacts of the uranium mining project from both on-site and adjacent areas that may lie beyond the mining lease area, as well as matters of compliance with international atomic energy standards for uranium mining.

A copy of the ESIA should be submitted to the World Heritage Centre for review by IUCN as soon as it is available, and before any decisions are taken.

Recommendation 11: Noting that there are several uncertainties and that multiple methodologies may be adopted for the Mkuju River Project, ensure that an ESIA is undertaken for each proposed extraction method, and that in addition, the operator undertakes a study to assess the cumulative impacts of all activities, methods of uranium extraction, interventions, and construction of facilities at the site.

In the 2013 Reactive Monitoring mission report, the potential risk of introducing invasive alien species (IAS) through the new road access and vehicle traffic was raised. In order to mitigate the introduction of seeds, Mantra was able to confirm that they will firstly be having a car-wash system

[17] IAEA: *IAEA mission says Tanzania faces challenges in radiation safety regulation*. Press Release 14 October 2015. https://www.iaea.org/newscenter/pressreleases/iaea-mission-says-tanzania-faces-challenges-radiation-safety-regulation.

[18] Nuclear Energy Institute (2015) Radon Safety Measures in Uranium Mining.https://www.nei.org/Master-Document-Folder/Backgrounders/Fact-Sheets/Radon-Safety-Measures-in-Uranium-Mining. Accessed 10 March 2017.

[19] Agency for Toxic Substances and Diseases Registry (2011) Toxic substances portal: Radon. https://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=71. Accessed 10 March 2017.

in place at the entrance to the project site. Furthermore, certain vehicles will be prevented from entering certain restricted areas of the mine.

When the World Heritage Committee adopted the extraordinary decision to accept the minor boundary modification of the property to facilitate a uranium mine, one of the conditions given was for the State Party to provide additional valuable wildlife forest area (**36 COM 7B.7**). The authorities met with during the mission confirmed that discussions are on-going, and some progress is being made to identify a suitable area. This was indicated to be in the northeast of the property, but no documentation or map was available to supplement this information. The mission recalls that the 2012 IUCN Evaluation report[20] noted that the State Party had decided to add the Undendeule Forest to the property but no update has been provided in this regard.

Recommendation 12: Provide an update on the additional valuable wildlife forest area to implement the Committee Decision **36 COM 8B.43** to propose an extension of the property.

3.3.2 Other mining, oil and gas concessions

An online cadastre for all mining and prospecting licences across Tanzania is available on the MEM website[21]. According to the online cadastre, 48 prospecting licences overlap with the property in January 2017. In view of the Committee's clear position that mining inside a World Heritage property is incompatible with its World Heritage status, and the State Party's pledge to not allow any other mining activities within the property after the minor boundary modification in 2012, the overlap of these prospecting licence areas with the property have been a major concern for the Committee.

In response, the mission was informed by the relevant authorities that prospecting rights do not supersede surface rights in Tanzania. MEM will issue a prospecting licence to a requesting applicant, but the applicant must then obtain permission from the land rights owner. When the prospecting licence is issued, MEM will include a cautionary note to warn the applicant should the licence overlap with a protected area. In the case of SGR, the applicant must therefore request permission from TAWA before any mining can commence. However, TAWA has confirmed that they will not permit any further mining activities within SGR.

This raises the question of the purpose for issuing a prospecting licence when a mining licence cannot be obtained. It was explained to the mission that according to the Mining Act of 2010, an applicant cannot be denied a prospecting licence, as long as the area is vacant. In addition to an application fee, there is an annual rent for the prospecting licence area to be paid by the applicant, until such time the licence is returned. The maximum size of a uranium prospecting licence is 300 km^2, and the lease amount is 100 USD/km^2 per year, with the fees increasing after the first and second renewals. At each renewal, 50% of the area held is relinquished[22,23]. Special permission can be obtained under exceptional circumstances but these will be charged at a higher rate, e.g. Mantra has an annual fee of 5,000 USD/km^2/year for MRP.

[20] World Heritage Minor Boundary Modification Proposal – IUCN Technical Evaluation: Selous Game Reserve (Tanzania) – ID No. 199. Downloaded from http://whc.unesco.org/en/list/199/documents/.
[21] http://portal.mem.go.tz/map/
[22] The Mining (Minerals Trading) (Amendment) Regulations, 2012.Downloaded from: https://mem.go.tz/wp-content/uploads/2014/08/SUBSIDIARY-LEGISLATION00011.pdf.
[23] Tanzania Mining Industry Investor's Guide 2015.The United Republic of Tanzania Ministry of Energy and Minerals.Downloaded from: https://mem.go.tz/wp-content/uploads/2015/11/04.11.15TANZANIA_Mining-Industry-Investor-Guide-June-2015_v10b.pdf.

The issuing of prospecting licences therefore, appears to be intended to avert any opportunistic application by having annual rent fees, whilst benefiting the State Party. Although the most encouraging mechanism to support TAWA in ensuring the protection of SGR would be to revoke the system of issuing prospecting licences that overlap with a World Heritage property, the mission also noted TAWA's commitment to not approve any further mining within the property.

Prior to the field visit, IUCN was made aware of an oil and gas concession (Kilosa-Kilombero) that was recently granted. Although it is mainly to the west of the property, it appeared to overlap nevertheless with the property. The relevant authorities met on the mission confirmed that an EIA has been conducted for the project, and that the project will take place to the west of the property, hence the project will not overlap with the property.

However, after the mission visited Tanzania and during the drafting of the report, the mission received further information on the concession. The proposed prospecting area, called Kito-1, lies in the Kilombero Valley Floodplain Ramsar site. This is located upstream of the property, and the Kilombero Valley Floodplain with its rivers, supplies two thirds of the Rufiji River's waters[24]. Furthermore, Kilombero Valley is dominated by an extensive floodplain that seasonally floods, and one of its rare and unique characteristics is its intact natural wetland ecosystem comprising of a myriad of rivers. The mission notes with concern therefore, the potential impacts of both prospecting and possible future oil and gas development in a valley that is flooded in the wet season on the property and downstream systems. A statement made by Otto Energy Ltd, who owns 50% of the share stated in 2016, that *'a discovery at Kito would open up several follow up targets within the Kilosa-Kilombero Licence'*[25]. In a press release issued by the project operator, Swala Oil & Gas plc (Swala), it communicates its plan to start drilling the Kito-1 exploration well in third quarter of 2017[26].

Considering the above, it is crucial that a comprehensive specialist study on the hydrological regime of the floodplain is undertaken, which assesses how the hydrology of the system is affected by oil and gas exploration, and any possible future developments. This specialist study should be submitted to IUCN for review and it should also subsequently inform the EIA for the oil and gas exploration, which includes a specific assessment of potential downstream impacts on the OUV of the property. The mission considers that the drilling cannot be permitted until a specialist study and an EIA which assesses all the above components have been reviewed by IUCN.

Recommendation 13: Undertake a specialist study on the hydrological regime of the floodplain, which should inform the subsequent EIA for the proposed Kito-1 oil and gas exploration site in the Kilombero Valley Floodplain. The EIA should comprehensively assess potential downstream environmental impacts on the OUV of the property. Both the specialist study and the EIA should be submitted to the World Heritage Centre for review by IUCN, before permitting the drilling to proceed and prior to taking any decision that may be difficult to reverse, in accordance with Paragraph 172 of the *Operational Guidelines*.

[24] Ramsar (2002) Information sheet on Ramsar Wetlands (RIS): The Kilombero Valley Floodplain. Downloaded from: https://rsis.ramsar.org/RISapp/files/RISrep/TZ1173RIS.pdf.Accessed 15 March 2017.
[25] Otto Energy (2016) ASX Announcement 21 June 2016: Farm down of upcoming Tanzania Drilling. Downloaded from http://www.ottoenergy.com/irm/PDF/2010_0/FarmDownofUpcomingTanzaniaDrilling.
[26] Swala Oil and Gas (Tanzania) Plc. Press Release: Termination of the default dispute against Swala. 3 March 2017. http://www.swala-energy.co.tz/documents/TerminationoftheDefaultDisputeAgainstSwala.pdf.

3.4 Other

3.4.1 Intrusion by cattle

Increasing and intensifying livestock grazing is posing a considerable threat to protected areas across Tanzania, and is already raising concerns in areas such as Ngorongoro Conservation Area World Heritage site[27] as well as in areas adjacent to SGR such as the Kilombero Valley Ramsar site. According to a government report, 25 million cattle were reported in Tanzania in 2015 and their numbers have steadily increased by 5% per annum since 2003[28]. Excessive livestock grazing can cause degradation of habitats and aquatic ecosystems, compete with wildlife, and may contribute towards disease transmission.

TAWA noted that a number of incidences of people bringing their cattle inside the property to graze have occurred, which were identified via ground and aerial patrols. The mission did not directly observe such cases but TAWA noted these to have occurred mainly in the northern section of the property, where subsequently, aerial patrol efforts were significantly increased and focussed in order to ensure eviction of livestock and compliance with protected area status.

Livestock grazing inside the property is therefore currently limited and is not a threat to the property at present. However the mission considers that it is an emerging threat that requires considerable effort in order to secure a long-term solution.

Recommendation 14: Rapidly consider developing a strategic plan and interventions to secure a long-term solution that will ensure livestock grazing does not become a serious threat to the OUV of the property.

3.4.2 Invasive Alien Species

The 2013 Reactive Monitoring mission identified the existence of a number of invasive alien species (IAS) within the property, namely *Azolla filiculoides*, *Pistia stratiotes*, *Mimosa pigra* and *Lantana camara*. Of the above, the management authorities who met with this mission were only able to confirm the presence of *P. stratiotes*. The mission considers that it is very unlikely that the aquatic species *P. stratiotes* and *A. filiculoides* would pose a significant threat to the biodiversity in the property given that they would be exposed and die during the dry season or would be flushed from the area during flooding or high flow of rivers. The mission did not make any direct observations of these species inside the property.

M. pigra and *L. camara* on the other hand, are very aggressive invaders that are listed on the world's 100 worst IAS[29]. The former can disperse its seed pods over long distances carried by flood waters, converting natural floodplain ecosystem and pastures into unproductive scrubland[30], whilst the

[27]UNESCO (2015) Report of the World Heritage Centre and World Heritage Advisory Bodies on the State of Conservation of Ngorongoro Conservation Area. State of Conservation Information System of the World Heritage Centre.<http://whc.unesco.org/en/soc/3255>.

[28] United Republic of Tanzania, Ministry of Livestock and Fisheries Development (2015) Tanzania Livestock Modernization Initiative, July 2015.

[29]Lowe S, Browne M, Boudjelas S & De Poorter M. (2000) *100 of the World's Worst Invasive Alien Species: A selection from the Global Invasive Species Database*. Published by The Invasive Species Specialist Group (ISSG); a specialist group of the Species Survival Commission (SSC) of IUCN. http://www.iucngisd.org/gisd/pdf/100English.pdf.

[30] Global Invasive Species Database (2017) Species profile: *Mimosa pigra*. Downloaded from http://www.iucngisd.org/gisd/speciesname/Mimosa+pigra on 24 February 2017.

latter can become a dominant understory species distributed by frugivorous birds especially in disturbed natural forests[31].

The mission was informed that rangers are trained to record presence of invasive species during their censuses, but the list of species the rangers are trained in was not made available to the mission.

Recommendation 15: Continue to monitor the property for invasive alien species (IAS) and include specific IAS management control strategies in the revised General Management Plan and to ensure resources and time are put in place for their effective implementation.

[31] Global Invasive Species Database (2017) Species profile: *Lantana camara*. Downloaded from http://www.iucngisd.org/gisd/speciesname/Lantana+camara on 24 February 2017.

4. Assessment of the state of conservation of the property

Commendable efforts to tackle poaching have been demonstrated by the State Party, and additional projects are planned to further their efforts. Increasing patrolling, increased arrests and decrease in carcasses are encouraging results but it is important to consider other factors, such as the evolving tactics of criminals and the much reduced population status of elephants. It would be incorrect and misleading to interpret the 2013 and 2014 aerial elephant census data as showing any population growth trend due to the array of errors that need to be factored in. It is therefore not possible to determine the status of the elephant population in the property at present until a demographic study is undertaken. There is a need to secure SNWC, and the WWF satellite collar project that will enhance understanding of habitat use.

A very small population of black rhinoceros may still be present in the property, but this firstly requires verification and secondly, the viability of the population needs to be determined. With regards to the other species referred to in the SOUV, specific data on all species is not available. As buffalo has been selected as an indicator in the DSOCR to represent the status of all ungulates in SGR, it appears that further conservation efforts are required to support the recovery of these species.

Aerial census data need to be interpreted with caution as described above, but it is clear that wildlife population in SGR, at least the mega-vertebrates, have suffered significantly in recent times, which directly impact the OUV of the property under criterion (x). On the other hand, the mission considers that the vegetation and landscape of the property are in good conditions at present and are well maintained. The development of the proposed Stiegler's Gorge Dam however, would be highly destructive to SGR and also detrimental to natural hydrological functioning of the Rufiji River system, thereby adversely impacting the OUV under criterion (ix). Unless the mining at MRP is carefully designed, monitored and best practices followed, there is a potential risk of contamination of aquifers that flow downstream into the property. Similarly, the Kito-1 exploration site in Kilombero Valley Floodplain situated upstream of the property has the potential to have serious impacts on the water that flows into the Rufiji River.

There are evidently on-going threats to the property, and until such time that the State Party can demonstrate that wildlife poaching is under control and the elephant and rhino populations are increasing in number, the mission considers that the property should remain on the List of World Heritage in Danger.

Furthermore, there are a number of additional issues that have not been discussed in section 3 but should be considered, as follows:

- **Fire** is a serious issue during the dry season through both natural causes and arson by cattle herders. As a counter-measure, TAWA identifies susceptible areas and conducts a controlled 'early burning' scheme in June/July. In the case that fire is discovered, a back-burning approach is taken. The State Party is currently in the process of developing a Fire Management Plan for SGR, with plans to integrate real-time fire monitoring systems through e.g. ESRI. The mission notes that the State Party may wish to consult IUCN for advice in drafting the Plan.

- Currently more than 70% of the revenue into TAWA is derived from **trophy hunting** in Game Reserves and game controlled areas. Since USA's recent introduction of suspension on the import of elephant and lion trophies, the tourism industry in SGR has seen a significant decline in revenue, although tourist numbers are reportedly still relatively constant due to other species such as buffalo. As with consumptive use in WMAs, trophy hunting can contribute to the overall conservation of species and sustainable use, but equally it is

essential to carefully monitor and enforce quota and selection of individuals of the target species. On-going efforts to ensure compliance are needed in this regard, but also in light of decreasing revenue generation, the State Party may need to explore additional mechanisms to secure a financially sustainable solution.

- A suspension of resident hunting was introduced in late 2015 for a period of two years to control the consumption of **bushmeat**[32]. Considering that the two year ban will expire this year, future management of wildlife needs careful consideration and planning.

A number of large-scale projects occurring in Tanzania that concern SGR were described to the mission, which included: the United States Agency for International Development (USAID) funded Promoting Tanzania's Environment, Conservation and Tourism (PROTECT) project (with aim to improve national capacity for conservation); World Bank funded Southern Agricultural Growth Corridor of Tanzania (SAGCOT) project (aiming to develop agricultural potential e.g. sugar and rice); World Bank funded Resilience Natural Resource Management Growth (REGROW) project (focussing on infrastructure development in southern Tanzania to promote tourism), and KfW funded SECAD project (with goals to strengthen SGR management, WMAs and SNWC, and improve infrastructures). With overlapping timelines for these projects, it was not clear to the mission how much communication and coordination is occurring between the different donors, projects, and government ministries. Naturally, there are implications for some of the project activities that need to be considered as part of the overall management of SGR. The mission therefore strongly encourages the State Party to consider all of the different components of the projects in its approach to protect the property as part of the larger Selous ecosystem.

A Strategic Environmental Assessment (SEA) was first requested by the Committee in its Decision **37 COM 7B.7** in light of the multiple projects planned concerning the property, and thereby a means to comprehensively identify their cumulative impacts on the OUV of the property including its conditions of integrity. The projects the Committee requested the State Party to consider in the SEA were the Mkuju mine, Stiegler's Gorge Dam, Kidunda Dam, agriculture and associated infrastructure, such as a road construction. In the meetings with the relevant authorities, it has become clear that although Stiegler's Gorge Dam project has not yet been abandoned by the government of Tanzania and has been included in the updated Power Master Plan, actualisation of the project appears to be very low down on their priority list. The mission was also informed that the methodology for uranium ore extraction at Mkuju has not yet been determined, that an EIA will need to be undertaken and reviewed by all relevant stakeholders once the extraction method has been further considered, and that due to the current unfavourable uranium prices, there is no estimated timeline or confirmation for initiating the project. The latest development on oil and gas exploration in the Kilombero Valley Floodplain, which could start in a few months however, is of great concern.

In light of these new clarifications and updates, the mission considers that there are a number of uncertainties around the proposed projects and developments upon which to base an assessment on potential cumulative impacts. Should decision making on MRP progress in favour of project development and there is a definitive project description, and more clarity on the proposed infrastructural developments are available, as well as a decision to undertake the oil and gas exploration in the Kilombero Valley Floodplain, then there is a clear need to assess the cumulative impacts on the OUV of the property in the form of an SEA. At present, the mission notes that further clarifications are required before requesting the State Party to undertake an SEA.

The mission received a draft DSOCR and an Emergency Action Plan, dated September 2016. During the visit, the mission provided technical advice on the draft DSOCR, specifically on the use of aerial

[32] Tanzania: New Authority to Bolster Conservation of Wildlife. 18 October 2015. Accessible from: http://allafrica.com/stories/201510190396.html.

elephant census data as an indicator. As described above and in section 3.1.3, the mission noted the limitations and imprecisions with the SRF method, especially to draw conclusions from only two or three censuses. While the mission provided advice and recommendations, it is important to highlight the need for the State Party to submit the revised DSOCR to the World Heritage Centre, for endorsement by the Committee. Noting that TAWA intends to finalise and submit the revised DSOCR and Emergency Action Plan for the property by December 2017, this could be presented to the Committee at its 42nd session in 2018 for adoption.

5. Conclusions and recommendations

Considerable progress has been made by the State Party to address the poaching crisis in the property, and through international collaboration, further projects are in the pipeline to strengthen its efforts. Additional studies are however still needed to reliably monitor the recovery of wildlife, particularly elephants. Until such time that the State Party can demonstrate that wildlife poaching is under control and the elephant and rhino populations are increasing in number, the mission considers that the property should remain on the List of World Heritage in Danger.

A number of infrastructural and industrial projects are additionally being planned within or in the near vicinity of the property, which require careful monitoring and comprehensive EIAs to be undertaken to assess potential impacts on the OUV of the property, as well as a detailed assessment of the cumulative impacts of all of the current and proposed activities on the OUV, in the form of an SEA.

To summarise, the mission makes the following recommendations to the State Party:

Recommendation 1: Evaluate the 2005-15 General Management Plan for Selous Game Reserve (SGR) and produce a revised Plan for the next five years as a matter of priority. This Plan should be aligned with TAWA's Strategic Plan, which is currently undergoing development. Copies of both Plans should be submitted to the World Heritage Centre once they have been completed.

Recommendation 2: Rigorously and regularly apply the Management Effectiveness Tracking Tool (METT) in particular to assess effectiveness of anti-poaching activities as ground and aerial patrol monitoring technologies are applied and implemented.

Recommendation 3: Plan for continuity of the existing and planned conservation projects in the property and the wider Selous ecosystem with donors and implementers to prevent post-project collapse or decline at the end of the projects.

Recommendation 4: Conduct a scientific study of the elephant population demography in SGR to determine its age and sex structure including ageing of calves of <1 to approximately 6 years old, in order to determine the population growth. This will be a critically important indicator in support of any future proposal for the removal of the property from the List of World Heritage in Danger.

Recommendation 5: Undertake a research project to determine the size of the black rhinoceros population, its age and sex structure within the property. Building on the findings, it may be necessary to undertake a genetic study to determine the viability of the population, and thereby inform subsequent decision-making of the introduction of new genetic stock of this sub-species from sources elsewhere, provided that poaching is brought sufficiently under control to ensure the security of any released rhino.

Recommendation 6: Determine and undertake population monitoring of selected herbivore species populations to determine trends, in relation to the species (and subspecies) specified in the Statement of Outstanding Universal Value (OUV) of the property.

Recommendation 7: Produce a Management Plan for each of the 10 Wildlife Management Areas (WMAs) in the wider Selous ecosystem in line with the 2012 Wildlife Conservation (WMAs) Regulation. Such a Plan should include explicit interventions and activities that would strengthen the conservation management of each of these areas.

Recommendation 8: Consider a project design for Kidunda Dam that will not inundate any part of the property at full supply level. Should this not be possible, then noting the greater concern for the

project and to determine its acceptability in line with the World Heritage status, develop and incorporate into the ESIA for submission to the World Heritage Centre for review by IUCN, a model of the frequency, extent and duration of the flooding regime inside the property, resulting from the proposed Kidunda Dam, and determine survival tolerance levels of woody vegetation species to duration of inundation.

Recommendation 9: Permanently abandon the Stiegler's Gorge Hydropower project due to its obvious foreseeable adverse impact on the OUV of the property, and in line with the Committee's position that dams with large reservoirs located within World Heritage properties are incompatible with their World Heritage status, and pursue alternative options located outside of the property boundaries that will not impact on its OUV.

Recommendation 10: Should In Situ Leaching (ISL) be considered as a possible methodology for uranium ore extraction at Mkuju River Project (MRP) by Mantra, it should be ensured that the ESIA comprehensively addresses the following:

a) the potential impacts and mitigation measures of using the ISL approach, which includes a thorough assessment of the radioactive decay products of uranium;
b) an early warning system in the case of an accident or seepage and an emergency response to such events;
c) a long term plan for decommissioning and environmental monitoring following the mine closure;
d) all direct and indirect impacts of the uranium mining project on both on-site and adjacent areas that may lie beyond the mining lease area, as well as matters of compliance with international atomic energy standards for uranium mining.

A copy of the ESIA should be submitted to the World Heritage Centre for review by IUCN as soon as it is available, and before any decisions are taken.

Recommendation 11: Noting that there are several uncertainties and that multiple methodologies may be adopted for the Mkuju River Project, ensure that an ESIA is undertaken for each proposed extraction method, and that in addition, the operator undertakes a study to assess the cumulative impacts of all activities, methods of uranium extraction, intervention, and construction of facilities at the site.

Recommendation 12: Provide an update on the additional valuable wildlife forest area to implement the Committee Decision **36 COM 8B.43** to propose an extension of the property.

Recommendation 13: Undertake a specialist study on the hydrological regime of the floodplain, which should inform the subsequent EIA for the proposed Kito-1 oil and gas exploration site in the Kilombero Valley Floodplain. The EIA should comprehensively assess potential downstream environmental impacts on the OUV of the property. Both the specialist study and the EIA should be submitted to the World Heritage Centre for review by IUCN, before permitting the drilling to proceed and prior to taking any decision that may be difficult to reverse, in accordance with Paragraph 172 of the *Operational Guidelines*.

Recommendation 14: Rapidly consider developing a strategic plan and interventions to secure a long-term solution that will ensure livestock grazing does not become a serious threat to the OUV of the property.

Recommendation 15: Continue to monitor the property for invasive alien species (IAS) and include specific IAS management control strategies in the revised General Management Plan and to ensure resources and time are put in place for their effective implementation.

6. Annexes

6.1 Terms of Reference

IUCN Reactive Monitoring Mission: Selous Game Reserve (United Republic of Tanzania)
Dates: 8 to 15 February 2017

At its 40th session in Istanbul (July 2016), the World Heritage Committee requested the State Party of Tanzania to invite an IUCN Reactive Monitoring mission "in order to evaluate progress in combating poaching, and to assess the current status and likely impacts of the proposed In Situ Leaching at the Mkuju River Uranium Mine, the Stiegler's Gorge and Kidunda dam projects, and prospecting licenses overlapping with and adjacent to the property, as well as any other development that might impact the OUV of the property" (Decision **40 COM 7A.47**). IUCN will be represented by Mizuki Murai and Roger Porter.

The mission will carry out the following tasks:

1. Assess progress in combating poaching, including the development and implementation of the Emergency Action Plan for the property with the objective of halting poaching within the Larger Selous Ecosystem within 12 months of the Committee Decision **40 COM 7A.47**;

2. Assess the current status and likely impacts of proposed industrial development projects, including In Situ Leaching at the Mkuju River Uranium Mine, the Stiegler's Gorge and Kidunda dam projects, and prospecting licenses overlapping with and adjacent to the property;

3. Review progress with the implementation of the recommendations of the 2013 Reactive Monitoring mission;

4. In line with paragraph 173 of the *Operational Guidelines*, assess any other relevant conservation issues that may impact on the Outstanding Universal Value of the property, including the conditions of integrity and protection and management;

5. Based on the results of the above-mentioned assessment and discussion with the State Party representatives, review the proposal and provide recommendations for establishing the Desired state of conservation for removal of the property from the List of World Heritage in Danger (DSOCR), and for developing the corrective measures, including a time frame for their implementation;

The State Party will facilitate necessary field visits to key locations, including the proposed locations of the Stiegler's Gorge and Kidunda dams and the location of the Mkuju uranium mine. The mission should hold consultations with the Tanzanian authorities at national, regional and local levels, including representatives of the Tanzania Wildlife Authority (TAWA), the Ministry of Natural Resources and Tourism, the Ministry of Energy and Minerals, the Rufiji Basin Development Authority (RUBADA) and the National Environment Management Council (NEMC). In addition, the mission should hold consultation with a range of relevant stakeholders, including: i) representatives of key private stakeholders, including the company that will operate the Mkuju uranium mine and Odebrecht, which is the main proponent for the development of the hydropower plant at Stiegler's Gorge; ii) tourism sector representatives (including representatives of the tourism hunting sector); iii) representatives of local communities; iv) representatives of the bi-lateral and multi-lateral cooperation partners supporting the management of the property and of the Selous – Niassa corridor such as GIZ and the German Development Bank (KfW); v) NGOs (in particular FZS, WWF and

other organizations supporting the management of the property); and vi) relevant scientists, researchers and experts.

In order to ensure adequate preparation of the mission, the State Party should provide the following items, if available, to the World Heritage Centre (copied to IUCN) as soon as possible, and preferably no later than one month before the mission:

a) the most recent version of the management plan for the property;

b) the Emergency Action Plan and comprehensive time-series data on poaching, particularly of elephants;

c) the Environmental and Social Impact Assessment (ESIA) report of the Stiegler's Gorge dam project;

d) the Environmental and Social Impact Assessment (ESIA) report of the Kidunda dam project;

e) detailed documentation clarifying the measures taken to manage the impacts of the Mkuju River uranium mine on the property and its hydrology, including a new EIA to assess the impacts of the proposed In Situ Leaching;

f) details of any additional exploration and exploitation concession blocks inside and outside of the boundaries of the property.

Please note that additional information may be requested from the State Party and key stakeholders during the mission.

Based on the assessment of available information and discussions with the State Party representatives and stakeholders, the mission will develop recommendations to the World Heritage Committee regarding the status of the property on the List of World Heritage in Danger and provide guidance to the State Party on further recommended actions that will ensure conservation of the property's Outstanding Universal Value including its conditions of integrity. It should be noted that recommendations will be provided in the mission report (see below), and not during the course of the mission.

The mission will prepare a report on the findings and recommendations of this Reactive Monitoring mission no later than 6 weeks after the completion of the mission, following the standard format, for review by the World Heritage Committee at its 41st session (Kraków, 2017).

Annex I

Selous Game Reserve (United Republic of Tanzania) (N 199bis)

Decision: 40 COM 7A.47

The World Heritage Committee,

1. Having examined Document WHC/16/40.COM/7A.Add,
2. Recalling Decisions **36 COM 8B.43**, **37 COM 7B.7**, **38 COM 7B.95**, and **39 COM 7A.14**, adopted at its 36th (Saint Petersburg, 2012), 37th (Phnom Penh, 2013), 38th (Doha, 2014) and 39th (Bonn, 2015) sessions respectively,
3. Commends the State Party and its international partners for their efforts in addressing the poaching crisis and encourages all involved to consolidate and coordinate these efforts;

4. Acknowledges the progress made by the State Party to establish the Desired state of conservation for the removal of the property from the List of World Heritage in Danger (DSOCR), noting that further studies are ongoing to address gaps in elephant population data and to enable the establishment of a proposed timeframe for its implementation;

5. Requests the State Party to undertake an analysis of the current situation of black rhinoceros to estimate the number of rhino left in the property, to inform the response required to secure this population, and to revise the DSOCR accordingly, and also requests the State Party to submit, by **1 December 2017** an updated proposal for the DSOCR, for adoption by the Committee at its 42nd session in 2018;

6. Urges again the State Party to develop and implement a comprehensive Emergency Action Plan with the objective of halting poaching within the Larger Selous Ecosystem within 12 months, as originally recommended by the 2013 mission;

7. Welcomes the establishment of the Tanzania Wildlife Authority (TAWA) and its inauguration in October 2015, and also urges the State Party to ensure its timely and effective operationalization, as well as adequate and reliable resourcing;

8. Also commends the States Parties of Tanzania, Mozambique and China for the formalization of agreements on the transboundaryNiassa-Selous Ecosystem and on wildlife crime prevention, respectively, and strongly encourages all involved States Parties to report to the World Heritage Centre on the activities carried out in the framework of these agreements;

9. Reiterates its utmost concern about:

    1. the ongoing lack of clarity in terms of the extraction method, water monitoring and disaster preparedness as regards the Mkuju River Project (MRP),

    2. the ongoing Stiegler's Gorge dam project despite a high likelihood of serious and irreversible damage to the Outstanding Universal Value (OUV) of the property,

    3. the lack of submission of a complete Environmental and Social Impact Assessment (ESIA) on the Kidunda dam project, which seems to have been extended in its scope and therefore could have a higher impact on the integrity of the property,

    4. the legal possibility of mineral exploration and exploitation in the property and the overlapping mining and prospecting licenses, despite the commitment made by the State Party to not engage in any mining activity within the property, in line with the established position of the Committee that mining and oil and gas exploration and exploitation are incompatible with World Heritage status,

    5. the lack of reported progress in creating opportunities for local communities to participate in decision-making and benefit-sharing, including in Wildlife Management Areas (WMAs);

10. Reiterates its request to the State Party to undertake a Strategic Environmental Assessment (SEA) to comprehensively identify the cumulative impacts of mining, the potential Stiegler's Gorge and planned Kidunda dam projects, agriculture and associated infrastructure, such as road building, both within the property as well as in important wildlife corridors and dispersal areas that are critical for maintaining the OUV of the property, and further urges the State Party to abandon any plans for the different development projects which are incompatible with the World Heritage status of the property;

11. Also requests the State Party to invite an IUCN Reactive Monitoring mission to the property, in order to evaluate progress in combating poaching, and to assess the current status and likely impacts of the proposed In Situ Leaching at the Mkuju River Uranium Mine, the Stiegler's Gorge and Kidunda dam projects, and prospecting licenses overlapping with and adjacent to the property, as well as any other development that might impact the OUV of the property;

12. Requests furthermore the State Party to submit to the World Heritage Centre, by **1 February 2017**, an updated report on the state of conservation of the property, on the implementation of the above and on the 2013 mission recommendations, for examination by the World Heritage Committee at its 41st session in 2017;

13. **Decides to retain Selous Game Reserve (United Republic of Tanzania) on the List of World Heritage in Danger.**

6.2 Itinerary and Programme

IUCN REACTIVE MONITORING MISSION PROGRAMME TO SELOUS GAME RESERVE

Date/Time	Activity
7-Feb-17	Arrival of mission team at Julius Nyerere International Airport and drive to hotel
8-Feb-17	DAY 1
09:00 – 11:00	Review of the programme with MNRT
9-Feb-17	DAY 2
09:00 – 10.00	Courtesy call to Ministry of Natural Resources Permanent Secretary , Director-Wildlife Division , Tanzania Wildlife Management Authority (TAWA) and selected staff from the Ministry
10:00 – 10.30	Tea Break
10:30 - 11.30	Short brief on Selous Game Reserve World Heritage Site
11:30 - 12.30	Meeting with National Environmental Management Council, Environmental Impact Assessment Directorate and Rufiji Basin Development Authority - Discussion on the status of Environmental safeguard on Stiegler's Project
12.30 -13.30	Meeting with , Environmental Impact Assessment Directorate and KIDUNDA - discussion on Kidunda dam Project and ESIA
13:30 – 14.30	Lunch and Break
14:30 -17.00	Meeting with National Environmental Management Council , Environmental Impact Assessment Directorate and MANTRA TZ LTD – Discussion on the status of Environmental safeguard on Mkuju project
15:00-17.00	Courtesy call to UNESCO country field office
10-Feb-17	DAY 3
07:00 - 11.30	Travel to Matambwe
12:00 – 13:00	Lunch
14:00 – 16:00	Game drive
16:30 – 17:00	Stiegler's Gorge flyover
17:00 – 18:30	Arrive at Likuyu Seka (Mkuju)
19:00 – 20:00	Drive to Namtumbo
22:00 – 21:30	Dinner
21.30	Overnight at Namtumbo
11-Feb-17	DAY 4
07:00 – 8.00	Breakfast
08:00 -10.00	Courtesy call to District Commissioner and District Executive Director
10:00 – 11.45	Drive to Mbarang'andu Wildlife Management Area (WMA) and meeting with WMA representative and game scouts

11.45 – 15.00	Drive to Mantra Mkuju mining site
15.00 – 18.00	Meeting with Mantra/Uranium One, presentations and site visit
18.00 – 20.30	Drive to Namtumbo
21.00 – 22.00	Dinner
22.00	Overnight at Namtumbo
12-Feb-17	DAY 5
07.00 – 08.00	Breakfast
08:00 – 11.00	Travel to Matambwe
12:00 – 15.00	Presentations on anti-poaching efforts by Selous Game Reserve / Frankfurt Zoological Society
15.00 – 16.00	Lunch
16:00 – 19.00	Game drive
19.30	Dinner and overnight at Matambwe
13-Feb-17	DAY 6
07:00 – 08.00	Breakfast
08:00 – 09.00	Flight to Morogoro and travel to TAWA-HQ
09.00 – 10.00	Meeting with Director General, TAWA, and Director of Anti-poaching
10.00 – 13.00	Travel to Dar
13.00 – 14.00	Lunch
14.00 – 17.00	Discussion with Ministry of Energy and Minerals and Tanzania Atomic Energy Commission on Stiegler's Gorge, Uranium Mining and any other issues regarding the projects.
14-Feb-17	DAY 7
07800 – 09.00	Pick up from hotel to MNRT
09:00 – 11.00	Meeting with Tanzania Association of Tour Operator (TATO), Tanzania Safari outfitters Association (TASOA) and Tanzania Hunting Operator Association (TAHOA) – discussion on the tourism issues
11:00 – 11.30	Tea Break
11:30 – 14.00	Research/scientists (TAWIRI) – update information on Rhino and Elephants population
14:00 – 15.00	Lunch break
15:00 – 17.00	Meeting with State Party experts to discuss DSOCR and Emergency Action Plan (EAP)
15-Feb-17	DAY 8
07:30	Pick up from hotel
09:00 – 10.00	Ministry of Water and Irrigation and DAWASA – talk on current status of ESIA on Kidunda dam project
11:30 – 13.00	Meeting with NGOs and donors (GIZ, KfW, FZS, WWF) – consolidation of support efforts to Selous Game Reserve
13.00 – 13.30	Lunch break
13:30 – 15:00	Meeting with Wildlife Crime Unit
17.00 – 18.00	Meeting and debriefing with MNRT (PS and Senior staff)
16-Feb-17	DAY 9
	Departure of the mission team - JNIA

6.3 List of Participants

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6.4 Maps and figures

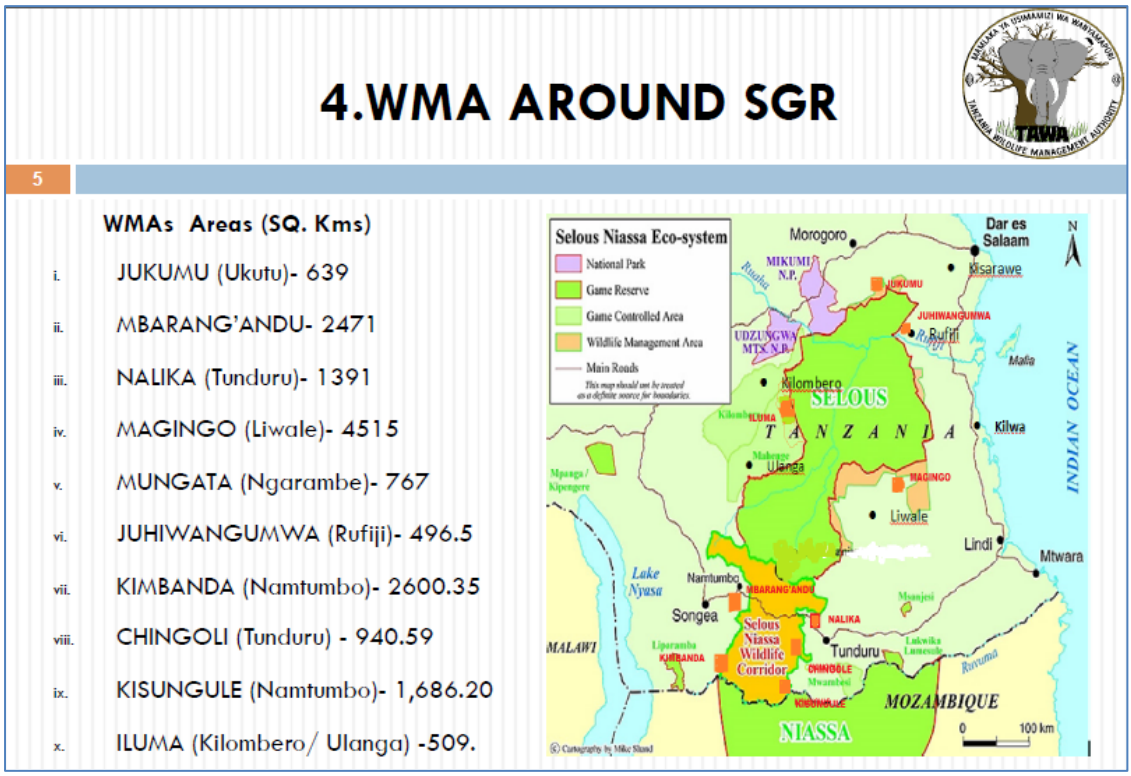

Figure 1. Locations and sizes of the ten Wildlife Management Areas (WMAs) around SGR (Source: TAWA presentation, 2017).

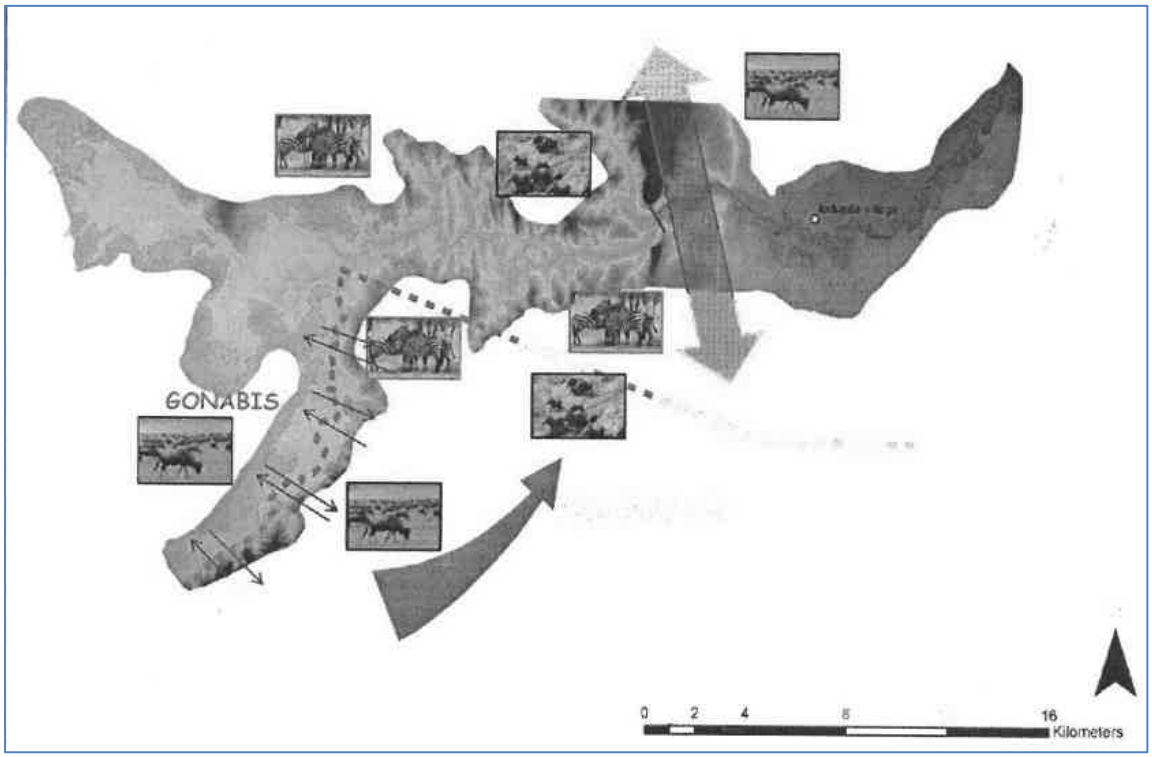

Figure 2. Wildlife movement between SGR and Gonabis, and the migration route to Wami-Mbiki WMA to the north. The large double-ended arrow illustrates the proposed potential re-routing corridor. (source: Ministry of Water and Irrigation).

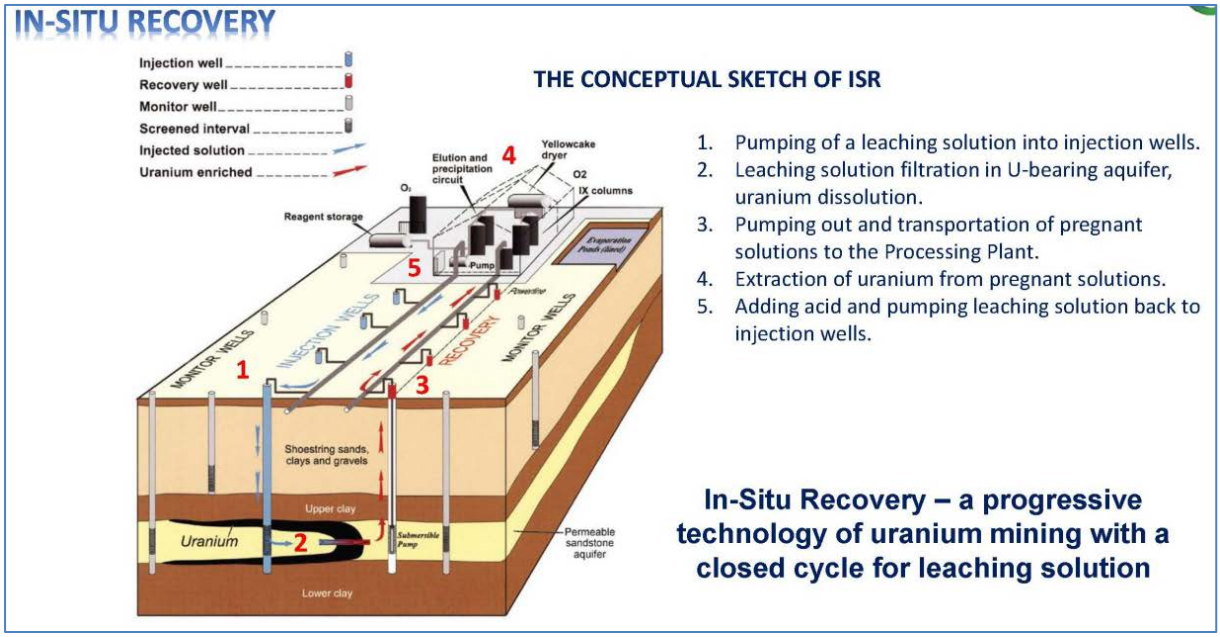

Figure 3. Diagram illustrating the proposed in-situ recovery method (source: Mantra-Tanzania Ltd).

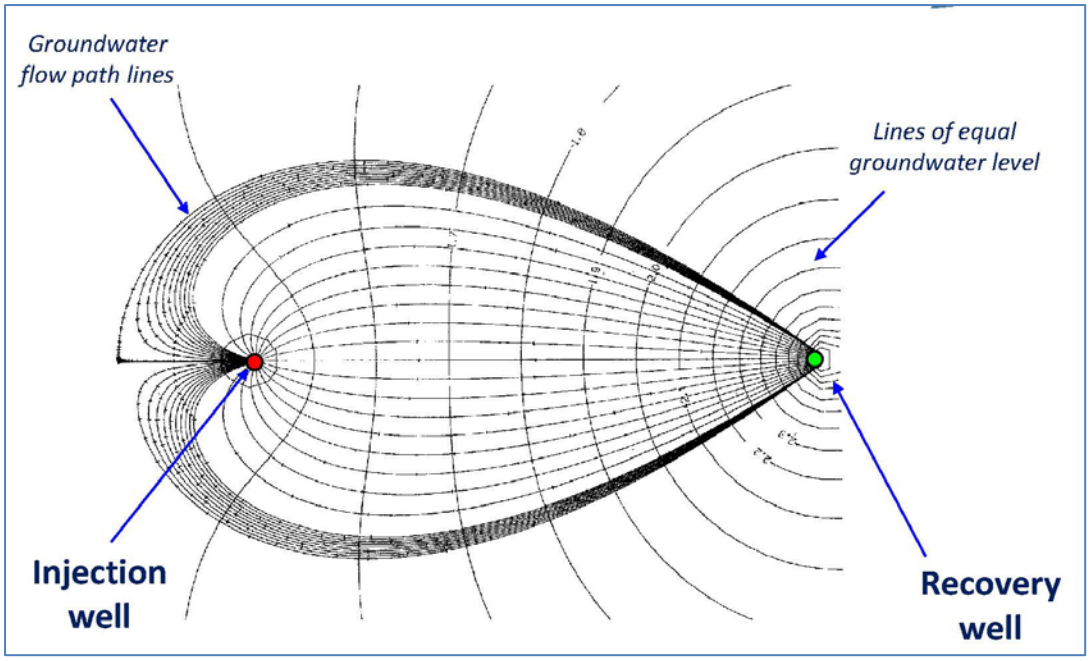

Figure 4.Diagram illustrating the conceptual groundwater flow path using the push-pull system.(source: Mantra Tanzania Ltd).

6.5 Photographs

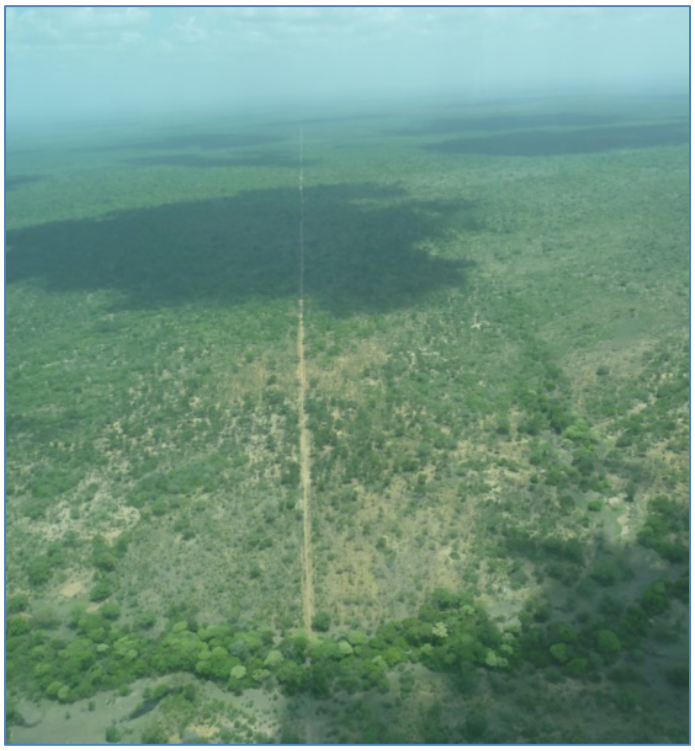

Photo 1.Northern Selous Border. ©IUCN/Mizuki Murai.

Photo 2. Area expected to be flooded by Kidunda Dam. ©IUCN/Mizuki Murai.

Photo 3.Proposed site for the Stiegler's Gorge Hydropower Dam. ©IUCN/Roger Porter.

Photo 4. In Situ Leaching wells at MRP uranium mine test site. ©IUCN/Roger Porter.

Photo 5.Mission with accompanying officials including the pilot of the light aircraft in Selous Game Reserve. ©IUCN/Roger Porter.

Photo 6. The only elephant observed by the mission in the Selous Game Reserve. ©IUCN/Mizuki Murai.

Photo 7. Nyassa wildebeest in Selous Game Reserve. ©IUCN/Mizuki Murai.

Photo 8. Hippopotamuses and crocodiles in Selous Game Reserve. ©IUCN/Mizuki Murai.

Photo 9. Diverse Miombo woodland and grassland vegetation types in Selous Game Reserve. ©IUCN/Roger Porter.

Photo 10. Rufiji River in Selous Game Reserve. ©IUCN/Roger Porter.